REMARKS

The Office Action mailed June 23, 2009 (*hereinafter* Action) has been received and its contents carefully considered. By this amendment, claims 2-3 and 7 are canceled without prejudice or disclaimer, and claims 1, 4, and 6 have been amended. Support for amended claim 1 can be found at least, for example, on page 1, paragraph 1 and on page 24, lines 25-32 of the specification and in original claim 3. Claim 4 is amended to depend from claim 1. Support for amended claim 6 can be found at least, for example, on page 23 lines 11-22. The Applicant believes that no new matter has been added.

Accordingly, upon entry of this Amendment, claims 1 and 4-6 are pending in the application. The Applicant thanks the Examiner for the careful consideration of this application. Based on the following remarks, the Applicant respectfully requests that the Examiner reconsider all outstanding rejections, and that they be withdrawn. Reconsideration is respectfully requested.

Claim Rejections – 35 U.S.C. § 112

Claims 3 and 7

Beginning on page 2, the Action rejected claims 3 and 7 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The Action alleges that the claims contain "subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention." Applicant respectfully traverses this rejection.

Claims 3 and 7 have been canceled and are no longer pending in this application. Thus, the Action's rejection to claims 3 and 7 are now moot.

Applicant respectfully requests removal of this rejection.

Claim 1

Applicant has amended claim 1 with similar language to canceled claim 3. Regarding the enablement rejection of claim 3 on page 2, the Action alleges that "each tap coefficient [h (k+1, m)] at time k+1 is **substantially 0**" (emphasis added). On page 3, the Action alleges, that "the low frequency offset components . . . will **not change significantly** relative to the sampling time interval" (emphasis added). Applicant respectfully disagrees.

Applicant notes page 13, lines 5-13 of the specification, which recite:

> If the input contains a frequency component that is too low to express, the echo canceller is affected by the low-frequency component that cannot be expressed and behaves as if different offsets are applied in the time segments 'a' to 'c' as shown in FIG. 2B. Then, a corresponding offset occurs, and the average of the tap coefficient does not become zero as if the offset is superimposed (the offset exists).

In other words, if the input contains a frequency component that is too low to express, an average of the tap coefficient is not necessarily zero in each time segment 'a,' 'b,' and 'c.'

Further, on page 14 of the specification in equation (7), for example, the second term of the right side, $\frac{1}{M}\sum_{i=0}^{M-1} h(k+1, i)$, is an average of the tap coefficients as illustrated in FIG. 3B1, 3B2 or 3B3. Since the tap coefficient behaves as if different offsets are applied in the time segments 'a,' 'b,' and 'c' when the input contains a

frequency component that is too low to express, the second term of the right side of equation (7), $\frac{1}{M}\sum_{i=0}^{M-1} h(k+1,i)$ **is not necessarily** zero (e.g., is a positive value in the time segment 'a' shown in FIG. 3A and FIG. 3B1 and is a negative value in the time segment 'c' shown in FIG. 3A and FIG. 3B3).

On page 3, the Action alleges that "calculating equation (8) will cause all of the tap coefficients to be set to a value of approximately 0, which would significantly degrade the adaptive operations of the filter." Applicant respectfully disagrees.

Applicant respectively notes Figs. 3B1, 3B2, and 3B3 where, an offset with a different tap coefficient occurs in each time segment, and therefore an average value of the offset is not necessarily zero. Further, equation (7) or (8) describe that an average value of the offset is calculated and the offset is corrected to zero using the calculated average value as shown in FIGs. 4B1 and 4C1 or FIGs. 4B3 and 4C3. Accordingly, equation (7) or (8) does **not** cause all of the tap coefficients to be set to a value of approximately zero and, therefore, does **not** degrade the adaptive operations of the filter.

Therefore, Applicant respectfully submits that claim 1 contains subject matter that is fully described in the specification in such a way to enable one skilled in the art to make and use the invention.

Claim Rejections – 35 U.S.C. § 103(a)

Claims 1, 2, and 4-6

Beginning on page 4, the Action has rejected claims 1, 2, and 4-6 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,876,751 to Gao et al. (*hereinafter* Gao) in view of U.S. Publication No. 2004/0001450 to He et al. (*hereinafter* He). The Applicant respectfully traverses this rejection.

Claim 1

As to claim 1, the Applicant submits that independent claim 1, as amended, is patentable over Gao in view of He for at least the following reason.

No reasonable combination of Gao with He discloses or renders obvious:

> an offset removal means for removing an offset component produced under an effect of low frequencies from the filter coefficient of the adaptive filter,
> wherein the offset removal means calculates a mean value, a weighed mean value, or a median value of the filter coefficients in a past predetermined period as an offset component for each filter coefficient, and removes the offset component from the filter coefficient of the adaptive filter

as recited, *inter alia*, by amended claim 1.

Gao, on the other hand, describes "an improved method for adaptively cancelling acoustic feedback in hearing aids and other audio amplification devices." Gao, column 1, lines 53-55. Gao discloses, "[a] DC removing module is included to periodically remove the DC offset from the adaptive file coefficient." *Id.* at column 12, lines 14-16. Gao further discloses that, "the following operation is implemented to estimate the DC offset in the filter coefficient and subtract the estimated DC offset from the ADF filter coefficients: $m(n) = 1/M * {}^{M-1}\Sigma_{k=0}\, w_k(n)$". *Id.* at column 12, lines 21-30. Further, on

page 5, the Action recites, "Gao does not disclose that the offset component is suppressed depending on whether or not low frequency components with a frequency lower than a predetermined frequency are present in the far-end input signal or the near-end input signal." Thus, Gao does not teach or suggest:

> an offset removal means for removing an offset component produced under an effect of low frequencies from the filter coefficient of the adaptive filter,
>
> wherein the offset removal means calculates a mean value, a weighed mean value, or a median value of the filter coefficients in a past predetermined period as an offset component for each filter coefficient, and removes the offset component from the filter coefficient of the adaptive filter

as recited, *inter alia*, by amended claim 1.

He fails to remedy the deficiencies in Gao. On page 5, the Action alleges that "He discloses an echo canceller system with a near end input low frequency filters 45, 49 in fig.2 to remove unwanted DC components. (Fig.2, [0027])." However, items 45 and 49 of Fig. 2 are DC notch filters. Paragraph 0027 of He discloses, "DC notch filter 45 receives Sin 37 and outputs Sin 38 to near-end signal detector 26 and monitor and control unit." Further, "DC notch filter 49 receives the output of adder 36 (Rout 40) and provides Rin 44 to near-end signal detector 26, adaptive filter 28, and monitor and control unit 30." Thus, He does not teach or suggest:

> an offset removal means for removing an offset component produced under an effect of low frequencies from the filter coefficient of the adaptive filter,
>
> wherein the offset removal means calculates a mean value, a weighed mean value, or a median value of the filter coefficients in a past predetermined period as an offset component for each filter coefficient, and removes the offset component from the filter coefficient of the adaptive filter

as recited, *inter alia*, by amended claim 1.

Therefore, no combination of Gao with He teaches or suggests:

> an offset removal means for removing an offset component produced under an effect of low frequencies from the filter coefficient of the adaptive filter,
>
> wherein the offset removal means calculates a mean value, a weighed mean value, or a median value of the filter coefficients in a past predetermined period as an offset component for each filter coefficient, and removes the offset component from the filter coefficient of the adaptive filter

as recited, *inter alia*, by amended claim 1. Hence, claim 1 is patentable and Applicant respectfully requests withdrawal of this rejection.

Claim 2

Claim 2 has been canceled and is no longer pending in this application. Thus, the Action's rejection of claim 2 is now moot.

Applicant respectfully requests withdrawal of this rejection.

Claims 4-6

Claims 4-6 depend either directly or indirectly from allowable claim 1. Therefore, claims 4-6 are 6 are allowable as being dependent from an allowable claim.

Applicant respectfully requests withdrawal of this rejection.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant, therefore, respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

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Respectfully submitted,

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